Each of the seven MASP system goals has undergone a series of alternative analyses, resulting in a recommendation for the ultimate airport system for each goal in the year 2030. Alternative analyses consisted of establishing and testing various combinations of service standards for each goal. Included for each alternative was: 1) surface travel time; 2) minimum airport classification; and 3) service thresholds. Surface travel time combinations tested were 30 and 45 minutes. Generally, a surface travel time of 30 minutes resulted in a system that was considered appropriately responsive. Service threshold combinations were tested at 90, 95, and 100 percent. In most cases, a 90 percent service threshold left too many holes in the system; and a 100 percent threshold resulted in a system that would be overbuilt. Results of that analysis, including a summary of how well the current system is responding to future needs, are presented for each system goal in the following section of the MASP report.

Serve Significant Population Centers

Goal

Provide service to significant population centers through year-round general aviation facilities.

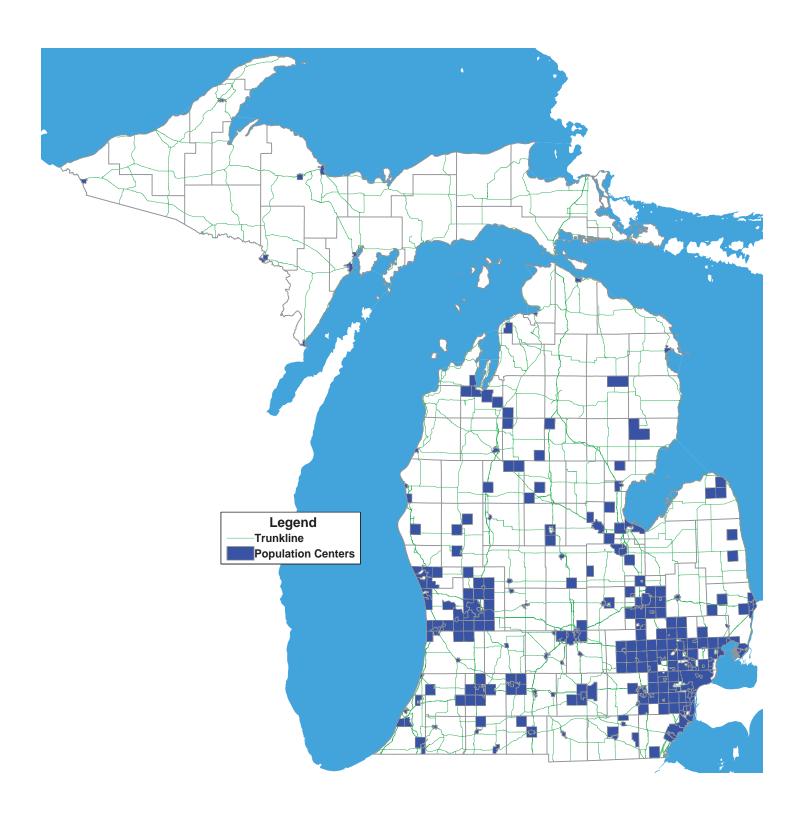
Background

Population centers are defined as a minor civil division of 5,000 or more people with a population density of 250 or more per square mile. In 2006, there were 259 population centers meeting these criteria. The 2030 forecast indicates that there will be 302 population centers meeting these criteria. Map 2 identifies the anticipated location of the population centers in 2030.



Map 2

Population Centers in Michigan, 2030



System Standards

The population centers system standard relates to the proximity of an airport to a population center, the minimum classification of airport needed to adequately respond to population centers, and the performance target percent for population centers to be served by those airports. Table 9 summarizes the system standards for population centers.

Table 9

System Standards – Population Centers		
Surface Travel Time	30 minutes	
Minimum Airport Classification	C-II	
Tier 1 Performance Target	95 Percent	
Tier 2 Performance Target	100 Percent	

Source: MDOT Bureau of Aeronautics & Freight Services

As described previously, the statewide travel demand model is the analytical tool used to determine the proximity of airports to population centers. That tool was used to determine the service area coverage of all candidate airports and the number and size of population centers used by those airports. In summary, population centers in Michigan should be served within 30 minutes surface travel time by airports in the C-II classification. The Tier 1 airport target is to meet the needs of 95 percent of the population centers. The Tier 2 airport target is to meet the needs of 100 percent of the population centers.

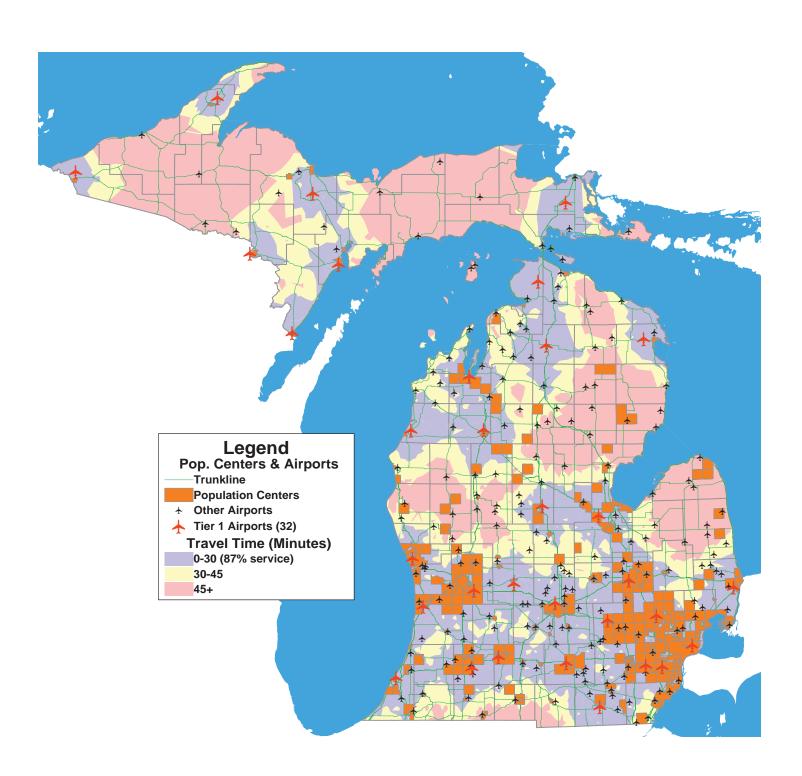
System Recommendation

To the extent possible, airports that were already serving population centers and had developed to the proper minimum airport classification were selected for inclusion in the population center alternative. Additional airports to be included in Tier 1 were selected based on a combination of population center size, remoteness from a previously included airport, and the number of additional population centers that would be served. The airports selected for inclusion in the preferred alternative and their 30-minute surface travel times are displayed in Map 3.



Map 3

Population Centers - Tier 1 Airport System Travel Times



Among the 32 airports, three require a reclassification to the C-II category. Those airports are:

- Ionia County Airport
- Mt. Pleasant Municipal Airport
- Menominee Marinette Twin County Airport

The other 29 airports currently meet the C-II airport classification standard. All 32 Tier 1 airports are identified in Table 10.

Table 10

City	Airport	Airport Reference Code
Adrian	Lenawee County	C-II
Alpena	Alpena County Regional	C-VI
Battle Creek	W.K. Kellogg	D-IV
Benton Harbor	Southwest Michigan Regional	C-II
Cadillac	Wexford County	C-II
Detroit	Detroit Coleman A. Young Municipal	C-II
Detroit	Detroit Metro Wayne County	D-V
Detroit	Willow Run	D-IV
Escanaba	Delta County	C-III
Flint	Bishop International	D-IV
Gaylord	Gaylord Regional Airport	C-III
Grand Rapids	Gerald R. Ford International	D-IV
Hancock	Houghton County Memorial	C-III
Holland	Tulip City	D-II
Howell	Spencer J. Hardy-Livingston County	C-II
Ionia	Ionia	B-II
Iron Mountain	Ford	C-III
Ironwood	Gogebic-Iron County	C-II
Jackson	Jackson County-Reynolds	C-II
Kalamazoo	Kalamazoo/Battle Creed International	C-III
Lansing	Capital Region International	D-IV
Manistee	Manistee County-Blacker	C-II
Marquette	Sawyer	D-V
Menominee	Menominee-Marinette Twin City	B-II
Mt. Pleasant	Mt. Pleasant Municipal	B-II
Muskegon	Muskegon County	C-III
Pellston	Pellston Regional of Emmett County	C-II
Pontiac	Oakland County International	D-III
Port Huron	St. Clair County International	C-III
Saginaw	M B S International	D-IV
Sault Ste. Marie	Chippewa County International	D-III
Traverse City	Cherry Capital	C-III

There are 10 Tier 2 airports included to respond to population center needs. Nine of the 10 airports do not currently meet the C-II airport classification for population centers.

Table 11

Tier 2 Airport System – Population Centers Minimum Airport Classification Standard: C-II			
City	Airport	Airport Reference Code	
Big Rapids	Roben-Hood	B-II	
Coldwater	Branch County Memorial	B-II	
Fremont	Fremont Municipal	C-II	
Hastings	Hastings City/Barry County	B-II	
Hillsdale	Hillsdale Municipal	B-II	
Ludington	Mason County	B-II	
Monroe	Monroe Custer	B-II	
Romeo	Romeo	B-II	
Sparta	Sparta	B-II	
Sturgis	Kirsch Municipal	B-II	

Source: MDOT Bureau of Aeronautics & Freight Services

Goal Achievement Summary

The system of airports identified in Table 12 results in the levels of performance achievement that follow:

Table 12

Goal Achievement Summary – Population Centers		
Number of Tier 1 C-II Airports	32	
Population Centers Served (percent)	87	
Number of Tier 2 Airports	10	
Population Centers Served (percent)	93	

Source: MDOT Bureau of Aeronautics & Freight Services

The 32 airports designated for inclusion in Tier 1 nearly meet the target performance objective of 95 percent with 87 percent served. The 10 airports included in Tier 2 provide 93 percent service.

Serve Significant Business Centers

Goal

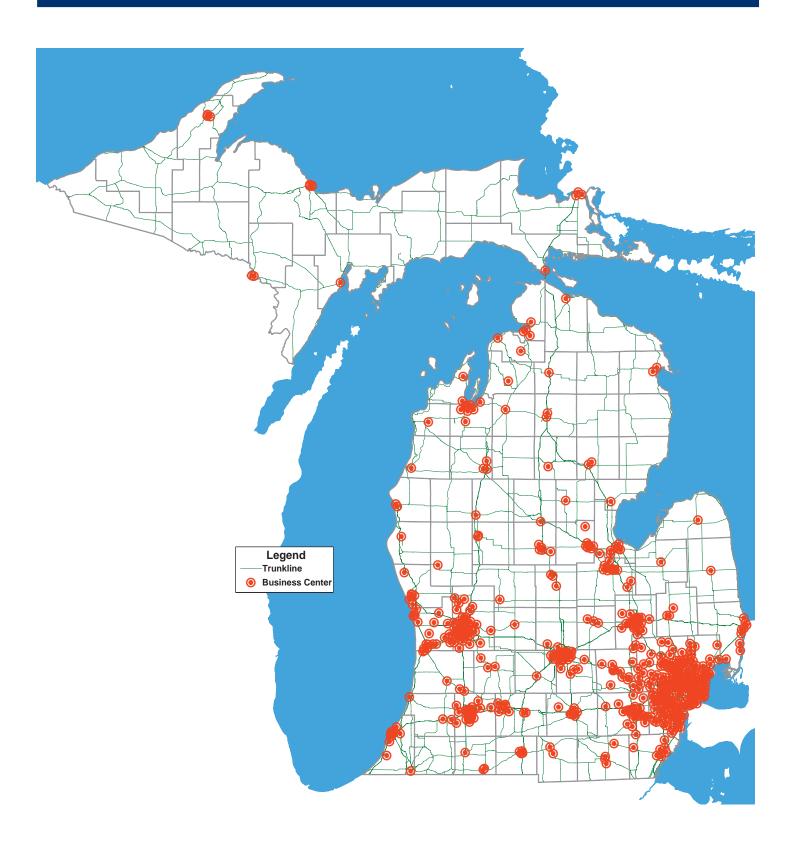
Support an airport system that adequately and effectively responds to the critical and essential business aviation needs of the state.

Background

In the year 2030, there are forecasted to be 568 TAZ's that will include business centers of 3,000 or more employees, subsequently 127 of the aforementioned zones will have 10,000 or more employees. These zones are concentrated in or near the state's major metropolitan areas. A number of zones are also located in or near many Michigan communities across the state. Map 4 displays the location of business centers in Michigan.

Map 4

Business Centers in Michigan, 2030



System Standards

Business centers system standards relate to proximity of an airport to a business center, the minimum classification of airport needed to adequately respond to business centers, and the performance target percent for business centers to be served by those airports. Table 13 summarizes the system standards for business centers.

Table 13

System Standards – Business Centers		
Surface Travel Time	30 minutes	
Minimum Airport Classification	C-II	
Tier 1 Performance Target	95 Percent	
Tier 2 Performance Target	100 percent	

Source: MDOT Bureau of Aeronautics & Freight Services

As described previously, the statewide travel demand model is the analytical tool used to determine the proximity of airports to business centers and was used to determine the service area coverage of all candidate airports as well as the number and size of business centers served by those airports. In summary, business centers in Michigan should be served within 30 minute surface travel time by airports in the C-II classification. The Tier 1 airport target is to meet the needs of 95 percent of the business centers. The Tier 2 airport target is to meet the needs of 100 percent of the business centers.

System Recommendation

To the extent possible, airports that were already developed to the proper minimum airport classification were selected for inclusion in the business center alternative. Additional airports to be included in Tier 1 were selected based on a combination of factors: business center size; remoteness from previously included airport; and the number of additional business centers that would be served. Among the 36 airports included in Tier 1 for business centers are nine airports that would require a reclassification to the C-II category. Those airports are:

- Big Rapids, Roben-Hood Airport
- Caro, Tuscola Area Airport
- Charlevoix, Charlevoix Municipal Airport
- Hillsdale, Hillsdale Municipal Airport
- Ionia, Ionia County Airport
- Grayling, Grayling Army Airfield
- Mt. Pleasant, Mt. Pleasant Municipal Airport
- Sturgis, Kirsch Municipal Airport
- West Branch, West Branch Community Airport

The other 27 airports currently meet the C-II airport classification standard. All 36 Tier 1 airports are shown in Map 5 and identified in Table 14.

Map 5

Business Centers - Tier 1 Airport System Travel Times

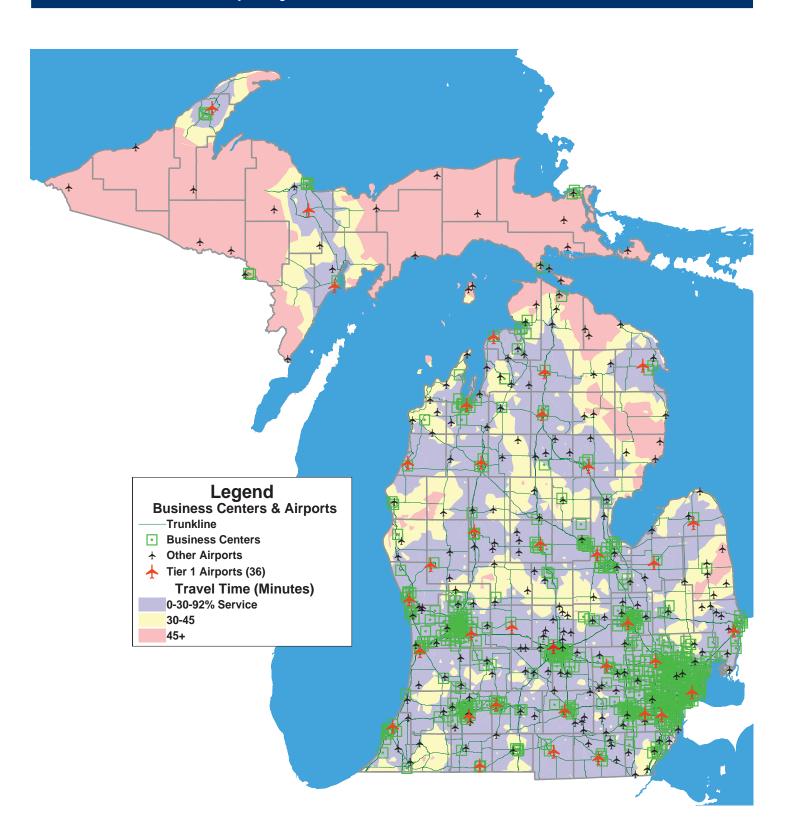


Table 14

City	Airport	Airport Reference Code
Adrian	Lenawee County	C-II
Alpena	Alpena County Regional	C-VI
Bad Axe	Huron County Memorial	C-II
Battle Creek	W. K. Kellogg	D-IV
Benton Harbor	Southwest Michigan Regional	C-II
Big Rapids	Roben-Hood	B-II
Cadillac	Wexford County	C-II
Caro	Caro	B-II
Charlevoix	Charlevoix Municipal	B-II
Detroit	Coleman W. Young Municipal	C-II
Detroit	Detroit Metro Wayne County	D-V
Detroit	Willow Run	D-IV
Escanaba	Delta County	C-III
Fremont	Fremont Municipal	C-II
Flint	Bishop International	D-IV
Gaylord	Otsego County	C-III
Grand Rapids	Gerald R. Ford International	D-IV
Grayling	Grayling Army Airfield	B-II
Hancock	Houghton County Memorial	C-III
Hillsdale	Hillsdale Municipal	B-II
Holland	Tulip City	D-II
Howell	Spencer J. Hardy-Livingston County	C-II
Ionia	Ionia	B-II
Jackson	Jackson County-Reynolds	C-II
Kalamazoo	Kalamazoo/Battle Creek International	C-III
Lansing	Capital Region International	D-IV
Manistee	Manistee County-Blacker	C-II
Marquette	Sawyer	D-V
Mt. Pleasant	Mt. Pleasant Municipal	B-II
Muskegon	Muskegon County	C-III
Pontiac	Oakland County International	D-III
Port Huron	St. Clair County International	C-III
Saginaw	M B S International	D-IV
Sturgis	Kirsch Municipal	B-II
Traverse City	Cherry Capital	C-III
West Branch	West Branch Community	B-II

Source: MDOT Bureau of Aeronautics & Freight Services

There are 14 Tier 2 airports included to respond to business center needs. Of these airports, 12 do not currently meet the C-II airport classification for business centers.

Table 15

Tier 2 Airport System – Business Centers Minimum Airport Classification Standard: C-II		
City	Airport	Airport Reference Code
Ann Arbor	Ann Arbor Municipal	B-II
Cheboygan	Cheboygan City-County	B-II
Coldwater	Branch County Memorial	B-II
Gladwin	Gladwin Zettel Memorial	B-II
Hart-Shelby	Oceana County	B-1
Hastings	Hastings City/Barry County	B-II
Iron Mountain	Ford	C-III
Ironwood	Gogebic-Iron County	C-II
Lapeer	DuPont-Lapeer	B-II
Niles	Jerry Tyler Memorial	B-II
Rogers City	Presque Isle County/Rogers City	B-II
Sandusky	Sandusky City	A-I
Sault Ste. Marie	Sault Ste. Marie Muni-Sanderson	B-II
Sparta	Sparta	B-II

Source: MDOT Bureau of Aeronautics & Freight Services

Goal Achievement Summary

The system of airports identified in Table 16 results in the levels of performance achievement that follow:

Table 16

Goal Achievement Summary – Business Centers		
Number of Tier 1 C-II Airports	36	
Business Centers Served (percent)	92	
Number of Tier 2 Airports	14	
Business Centers Served (percent)	97	

Source: MDOT Intermodal Policy/Statewide Transportation Planning Division

The 36 airports designated for inclusion in Tier 1 nearly meet the target performance objective of 95 percent with 92 percent coverage. The fourteen airports included in Tier 2 results in 97 percent of business centers being served. All of the business centers not served in Tier 1 or Tier 2 are marginally outside of the 30 minute surface travel time. No business center in the state is more than 37 minutes from an airport designated in either Tier 1 or Tier 2.

Additionally, all large business centers, those with 10,000 or more employees, are served by the airports selected for inclusion in Tier 1.

Serve Significant Tourism/Convention Areas

Goal

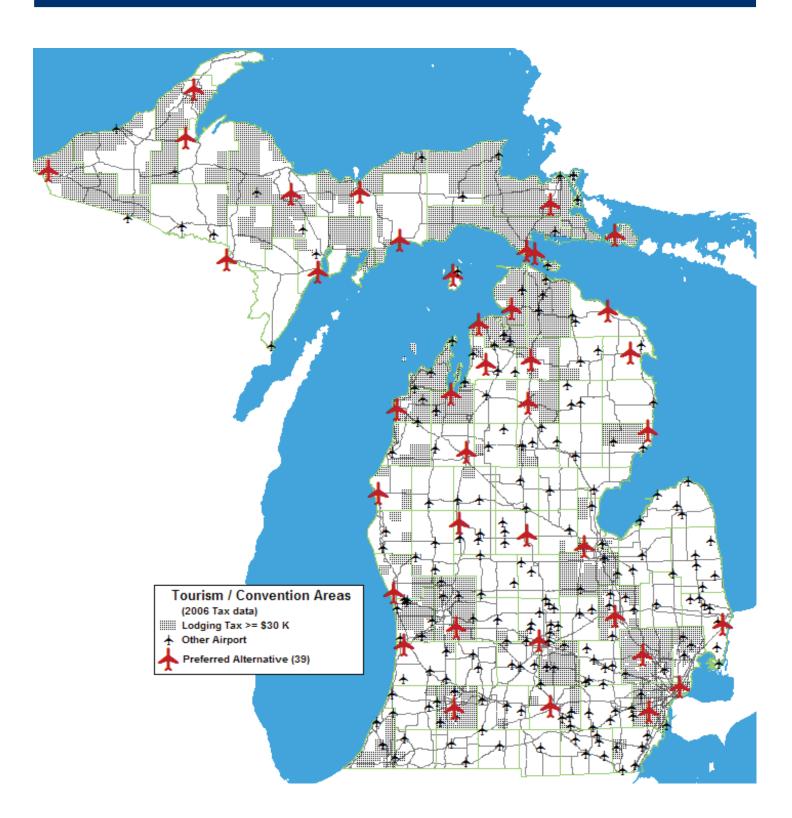
Support an airport system that adequately and effectively responds to the critical and essential tourism/convention aviation needs of the state.

Background

Tourism and convention areas in Michigan are identified by allocating lodging use taxes generated in each county to the travel analysis zones within each county based on TAZ employment as a percent of total county employment. TAZs with \$30,000 or more of annual lodging use tax generated, as reported to the Michigan Department of Treasury, are designated as tourism/convention areas. There were 523 tourism/convention areas in Michigan based on 2006 lodging tax receipts. Generally, these centers are located in or near major urbanized areas such as Detroit, Grand Rapids and Lansing, or somewhat concentrated in the northwestern parts of the Lower Peninsula and eastern portions of the Upper Peninsula. Map 6 displays the locations of tourism/convention areas in Michigan.

Map 6

Tourism/Convention Areas in Michigan



System Standards

Tourism/convention areas system standards relate to proximity of an airport to a tourism/convention center, the minimum classification of airport needed to adequately respond to tourism/convention areas, and the performance target percent for tourism/convention areas to be served by those airports. Table 17 summarizes the system standards for tourism/convention areas.

Table 17

System Standards – Tourism/Convention Areas		
Surface Travel Time	30 minutes	
Minimum Airport Classification	B-II	
Tier 1 Performance Target	95 Percent	
Tier 2 Performance Target	100 percent	

Source: MDOT Bureau of Aeronautics & Freight Services

As described previously, the statewide travel demand model is the analytical tool used to determine the proximity of airports to tourism/convention areas. This tool was used to determine the service area coverage of all candidate airports and the number and size of tourism/convention areas served by those airports. In summary, tourism/convention areas in Michigan should be served within a 30-minute surface travel time by airports in the B-II classification. The airports needed to respond to 95 percent of the tourism/convention areas are included in Tier 1. The airports needed to respond to 100 percent of the tourism/convention areas are included in Tier 2.

System Recommendation

To the extent possible, airports that were already developed to the proper minimum airport classification were selected for inclusion in the tourism/convention center alternative. Additional airports to be included in Tier 1 were selected based on a combination of tourism/convention center size, remoteness from a previously included airport, and the number of additional tourism/convention areas that would be served. Among the 39 airports included in Tier 1 for tourism/convention areas are two airports that would require a reclassification to the B-II category. Those airports are:

- Baraga, Baraga
- Munising, Hanley Field

The other 37 airports currently meet the B-II airport classification standard. All 39 Tier 1 airports are shown in Map 7 and identified in Table 18.

Map 7

Tourism/Convention Areas - Tier 1 Airport System Travel Times

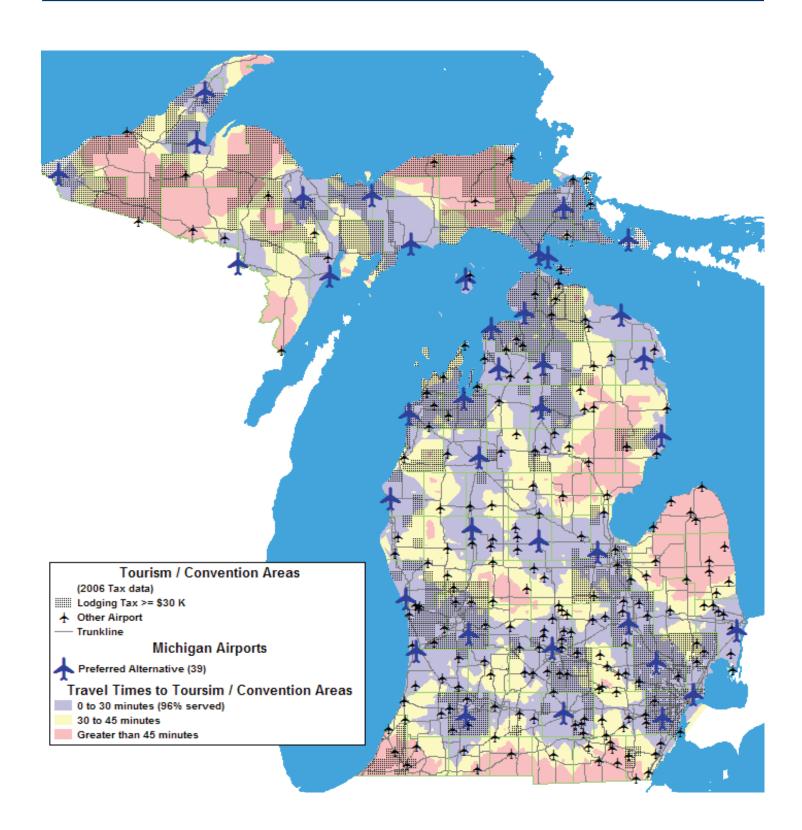


Table 18

City	Airport	Airport Reference Code
Alpena	Alpena County Regional	C-II
Baraga	Baraga	A-I
Beaver Island	Beaver Island	B-II
Bellaire	Antrim County	C-II
Big Rapids	Roben-Hood	B-II
Cadillac	Wexford County	C-II
Charlevoix	Charlevoix Municipal	B-II
Detroit	Coleman A. Young Municipal	C-II
Detroit	Detroit Metro Wayne County	D-V
Drummond Island	Drummond Island	B-II
Escanaba	Delta County	C-III
Flint	Bishop International	D-IV
Frankfort	Dow Memorial	B-II
 Gaylord	Gaylord Regional Airport	C-III
Grand Rapids	Gerald R. Ford International	D-IV
Grayling	Grayling Army Airfield	B-II
Hancock	Houghton County Memorial	C-III
Harbor Springs	Harbor Springs Municipal	B-II
Holland	Tulip City	C-II
Iron Mountain	Ford	C-III
Ironwood	Gogebic-Iron County	C-II
Jackson	Jackson County-Reynolds	C-II
Kalamazoo	Kalamazoo/Battle Creek International	C-III
Lansing	Capital Region International	D-IV
Ludington	Mason County	B-II
Mackinac Island	Mackinac Island	B-II
Manistique	Schoolcraft County	C-II
Marquette	Sawyer	D-V
Mt. Pleasant	Mt. Pleasant	B-II
Munising	Hanley Field	A-I
Muskegon	Muskegon County	C-III
Oscoda	Oscoda-Wurtsmith	D-V
Pontiac	Oakland County International	D-III
Port Huron	St. Clair County International	C-III
Rogers City	Presque Isle County/Rogers City	B-II
Saginaw	M B S International	D-IV
St. Ignace	Mackinac County	B-II
Sault Ste. Marie	Chippewa County International	D-III
Traverse City	Cherry Capital	C-III

Source: MDOT Bureau of Aeronautics & Freight Services

Those airports required to achieve 100 percent tourism/convention center coverage are designated in Tier 2 and include the nine airports identified in Table 19. Of these airports, three do not currently meet the B-II Airport Classification for tourism/convention areas.

Table 19

Tier 2 Airport System – Tourism/Convention Areas Minimum Airport Classification Standard: B-II		
City	Airport	Airport Reference Code
Clare	Clare Municipal	B-II
Fremont	Fremont Municipal	C-II
Manistee	Manistee County-Blacker	C-II
Newberry	Luce County	B-II
Northport	Woolsey Memorial	A-I
Ontonagon	Ontonagon County	B-I
Paradise	Paradise	B-I Proposed
South Haven	South Haven Area Regional	B-II
Sault Ste. Marie	Sault Ste. Marie Muni-Sanderson	B-II

Source: MDOT Bureau of Aeronautics & Freight Services

Goal Achievement Summary

The system of airports identified in Table 20 results in the levels of performance achievement that follow:

Table 20

Goal Achievement Summary – Tourism/Convention Areas		
Number of Tier 1 B-II Airports 39		
Tourism/Convention Areas Served (percent)	96	
Number of Tier 2 Airports	9	
Tourism/Convention Areas Served (percent) 99		

Source: MDOT Intermodal Policy/Statewide Transportation Planning Division

The 39 airports designated for inclusion in Tier 1 meet the target performance objective of 95 percent. The nine airports included in Tier 2 result in 99 percent of tour-ism/convention areas being served. All of the tourism/convention areas not served by either Tier 1 or Tier 2 are marginally outside of the 30-minute surface travel time. No tourism/convention center in the state is more than 35 minutes from an airport designated in either Tier 1 or Tier 2.

General Population Access

Goal

Preserve/develop the system of airports necessary to respond to essential/critical aviation needs of the general population.

Background

A basic level of air transportation service to all Michigan residents is important.

System Standards

General population access system standards relate to proximity of an airport to the general population, the minimum classification of airport needed to adequately respond to general population access, and the performance target percent for general population access to be served by those airports. Table 21 summarizes the system standards for general population access.

Table 21

System Standards – General Population Access			
Surface Travel Time	45 minutes		
Minimum Airport Classification	B-II		
Tier 1 Performance Target	95 Percent		
Tier 2 Performance Target	100 percent		

Source: MDOT Bureau of Aeronautics & Freight Services

As described previously, the statewide travel demand model is the analytical tool used to determine the proximity of airports to the general population. This tool was used to determine the service area coverage of all candidate airports and the population served by those airports. In summary, general population access in Michigan is provided by 45 minutes surface travel time by airports in the B-II classification. The airports needed to respond to 95 percent of the general population access are included in Tier 1. The airports needed to respond to 100 percent of the general population access are included in Tier 2.

System Recommendation

To the extent possible, airports that were already developed to the proper minimum airport classification were selected for inclusion in the general population access alternative. Additional airports to be included in Tier 1 were selected based on a combination of remoteness from a previously included airport and the amount of additional population that would be served. None of the 28 airports included in Tier 1 for general population access would require a reclassification to the B-II category. The 28 airports included in Tier 1 for general population access are shown in Map 8 and identified in Table 22.

Map 8

General Population Access - Tier 1 Airport System Travel Times

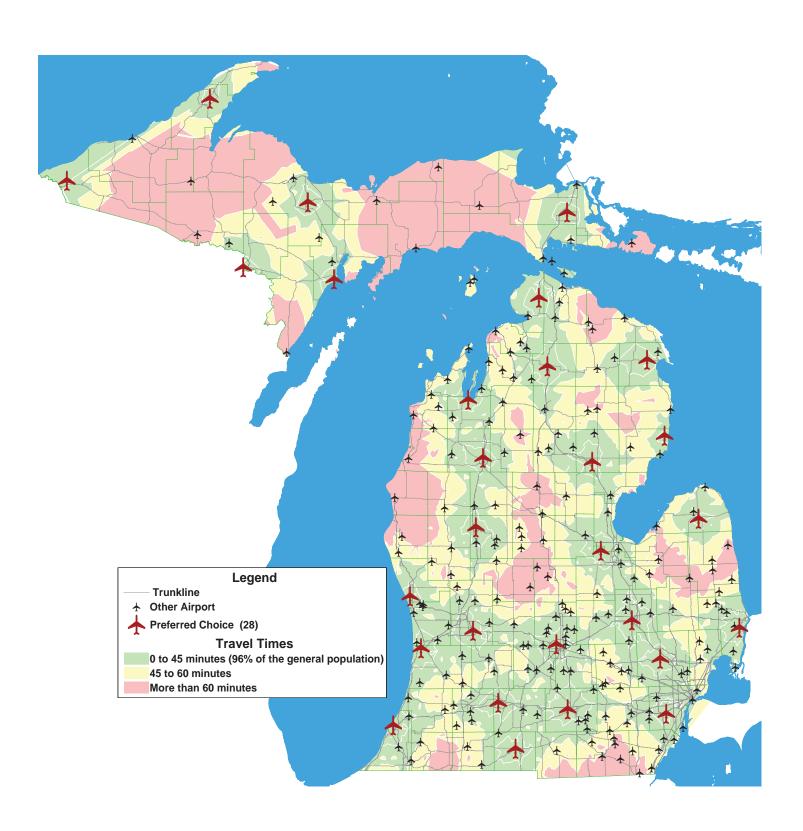


Table 22

Tier 1 Airport System – General Population Access Minimum Airport Classification Standard: B-II			
City	Airport	Airport Reference Code	
Alpena	Alpena County Regional	C-VI	
Bad Axe	Huron County Memorial	C-II	
Battle Creek	W.K. Kellogg	D-IV	
Benton Harbor	Southwest Michigan Regional	C-II	
Big Rapids	Roben-Hood	B-II	
Cadillac	Wexford County	C-II	
Coldwater	Branch County Memorial	B-II	
Detroit	Detroit Metro Wayne County	D-V	
Escanaba	Delta County	C-III	
Flint	Bishop International	D-IV	
Gaylord	Gaylord Regional	C-III	
Grand Rapids	Gerald R. Ford International	D-IV	
Hancock	Houghton County Memorial	C-III	
Holland	Tulip City	D-II	
Iron Mountain	Ford	C-III	
Ironwood	Gogebic-Iron County	C-II	
Jackson	Jackson County-Reynolds	C-II	
Lansing	Capital Region International	D-IV	
Marquette	Sawyer	D-V	
Muskegon	Muskegon County	C-III	
Oscoda	Oscoda-Wurtsmith	D-V	
Pellston	Pellston Regional of Emmet County	C-II	
Pontiac	Oakland County International	D-III	
Port Huron	St. Clair County International	C-III	
Saginaw	M B S International	D-IV	
Sault Ste. Marie	Chippewa County International	D-III	
Traverse City	Cherry Capital	C-III	
West Branch	West Branch Community	B-II	

Source: MDOT Bureau of Aeronautics & Freight Services

Those airports required to achieve 100 percent general population coverage are designated as Tier 2 and include the four airports identified in Table 23. All of these airports currently meet the B-II airport classification for service to the general population.

Table 23

Tier 2 Airport System – General Population Access Minimum Airport Classification Standard: B-II				
City	Airport	Airport Reference Code		
Manistee	Manistee County-Blacker	C-II		
Manistique	Schoolcraft County	C-II		
Marlette	Marlette Township	B-II		
Mt. Pleasant	Mt. Pleasant Municipal	B-II		

Source: MDOT Bureau of Aeronautics & Freight Services

Goal Achievement Summary

The system of airports identified in Table 24 results in the following levels of performance achievement:

Table 24

Goal Achievement Summary – Tourism/Convention Areas		
Number of Tier 1 B-II Airports	28	
General Population Served (percent)	96	
Number of Tier 2 Airports	4	
General Population Served (percent)	99	

Source: MDOT Intermodal Policy/Statewide Transportation Planning Division

The 28 airports designated for inclusion in Tier 1 meet the target performance objective of 95 percent. The four airports included in Table 27 result in a 99 percent service coverage rate of the state's population. By extending the service area coverage to 60 minutes rather than 45 minutes, virtually all Michigan residents would have access to an airport included in either Tier 1 or Tier 2.

Land Area Coverage

Goal

Preserve and develop the system of airports necessary to provide basic land area coverage.

Background

General aviation pilots operating their aircraft in Michigan should have access to an airport with a paved runway within 30 minutes in the event of a pilot or passenger emergency or an aircraft malfunction. These airports provide a network of facilities that are reachable in many emergency situations. Airports in adjacent states located near Michigan borders were included in determining land area coverage percentages.

System Standards

Unlike many of the previous system standards where surface travel time is a key variable, with land area coverage the system standards uses a 30-mile radius as a key variable. As with the other system goals, the target for goal achievement is 95 percent of land area coverage in Tier 1 and 100 percent in Tier 2. Table 25 summarizes the system standards for land area coverage.

Table 25

System Standards – Land Area Coverage		
Surface Travel Time	30 miles	
Minimum Airport Classification	B-I	
Tier 1 Performance Target	95 Percent	
Tier 2 Performance Target	100 percent	

Source: MDOT Bureau of Aeronautics & Freight Services

System Recommendation

To the extent possible, airports that were already developed to the proper minimum airport classification were selected for inclusion in the land area coverage alternative. Additional airports to be included in Tier 1 were selected on a combination of remoteness from a previously included airport. Among the 50 airports included in Tier 1 for land area coverage are three airports that would require a reclassification to the B-I category. Those airports are:

- Baraga, Baraga
- Mio, Oscoda County
- Munising, Hanley Field

The other 47 airports currently meet the B-I airport classification standard. All 50 Tier 1 airports are shown in Map 9 and are identified in Table 26.